

MISSISSIPPIAN-PENNSYLVANIAN UNCONFORMITY NEAR ADAMS MILLS, OHIO

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An interesting exposure of the Mississippian-Pennsylvanian unconformity occurs in a road cut on Ohio State route 16 one mile west of Adams Mills, Muskingum County. The locality is about one-half mile south of the Coshocton County border on the north side of Monroe Basin of the abandoned Ohio Canal.

The unconformity is well exposed for a distance of approximately 400 ft. along the cut, which trends about N 80°E. Three very small Mississippian "hills" and two "valleys" occur with a maximum exposed relief of 15 ft. The lower part of the "valleys" is covered. The slope angles on each side, however, indicate that the bottoms lie only a few feet beneath the cut, and the total relief is thought to be about 20 ft.

The exposed Mississippian rocks consist of approximately 15 ft. of light-grey, massive, fine-grained sandstone. This sandstone is probably part of the Waverly series but the particular formation was not determined. No fossils were observed. The sandstone is weathered just below the unconformity and is stained with iron oxide. At the east end of the cut a red clay lies above the sandstone and apparently beneath the line of unconformity. This clay is poorly exposed but occurs beneath a relatively level part of the unconformity and may be a fossil soil. Pennsylvanian light-colored clays containing plant remains occur above it. The line of unconformity in the cut is for the most part very sharp.

Overlying the Mississippian are grey to black, carbonaceous, concretionary, fissile shales grading upward into sandstone. The thickness and details of composition vary in each "valley" and over the "hill" tops. These sediments are thought to belong to the basal Pennsylvanian Pottsville formation. A few poorly preserved plant fossils were found. A thin layer of coaly material lies along the unconformity near the bottom of the western "valley" indicating that at least a part of this surface was covered with vegetation.

These lower Pottsville sediments exhibit the phenomenon of compaction similar to that described by Ver Steeg (1948) to the north in Wayne County. The fissile carbonaceous shales on the sides of the "valley" overlap each other layer by layer, indicating that the valleys filled slowly until the sediments covered the "hills". Compaction began as the sediments accumulated, and the sediments became bent into anticlines and synclines. Compaction was probably caused chiefly by expulsion of water.

The thickness of the section involved in the compaction folding is not known, as a local Pennsylvanian erosion surface cuts across the dipping sediments. Apparently, sediments were deposited on the unconformity and compacted, then deposition ceased and erosion removed a part of the sediments. Later, erosion ceased and deposition was resumed. Above the local unconformity thus produced the sediments are essentially horizontal and show no compaction folding.

The basal bed in this upper section is a medium grained, cross-bedded sandstone with a maximum thickness of about 2½ ft. It is resistant to weathering and generally forms a ledge. A similar appearing but thinner sandstone, also ledge forming, occurs in some parts of the upper portion of the compaction folded sediments. It is cut off near the tops of the compaction anticlines by the local erosion surface. Both this sandstone and the bed in the sequence above are underlain by a thin layer of clay and coaly material.

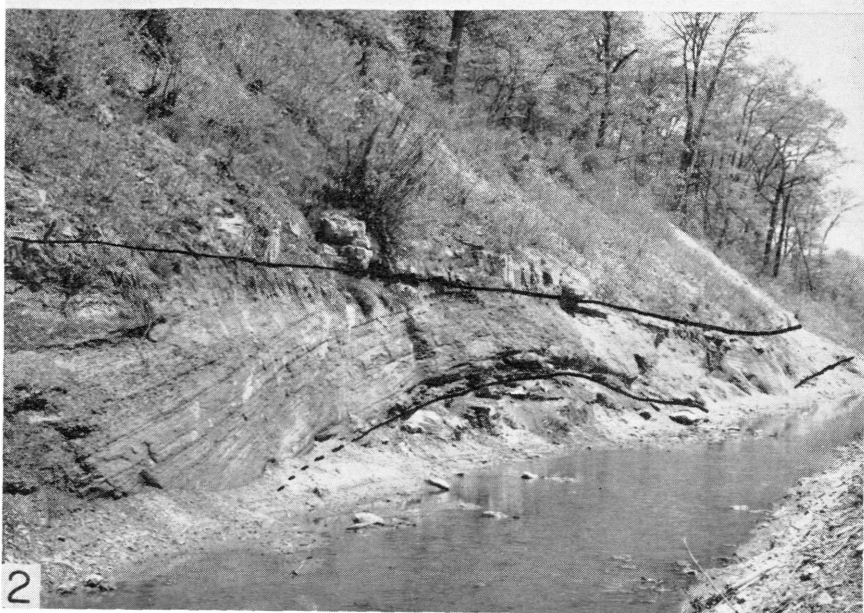


FIGURE 1. Unconformities in road cut west of Adams Mills, Muskingum County, Ohio. Lower ink line drawn along Mississippian-Pennsylvanian unconformity; upper ink line drawn along a local Pennsylvanian unconformity.

FIGURE 2. A small "hill" cut in Mississippian rocks. Pennsylvanian sediments are compacted over the "hill". Upper ink line indicates local Pennsylvanian unconformity. Note sandstone bed on right side of "hill" cut off near the crest by the upper erosion surface.

Only the lower few feet of this upper sequence are well exposed. Above the cross-bedded sandstone is a shale of unknown thickness containing some thin sandstone layers. Several feet farther up the hillside, bluish-black, fossiliferous flint and limestone crop out. This may be the Boggs member of the Pottsville described by Stout (1918) in northern Muskingum County.

REFERENCES CITED

- Stout, W.** 1918. Geology of Muskingum County. Ohio Geol. Surv., 4th. S., Bull. 21.
Ver Steeg, K. 1948. Mississippian Disconformity and Compaction. Ohio Jour. Sci. 48: 185-188.
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